

# **SIMPLED STRUCTURED VIBRATING SWITCH**

## **FIELD OF THE INVENTION**

The present invention relates to vibrating switches and particular to a vibrating switch without any steel ball and being installed obliquely. Thereby, the installation of the vibrating switch is easy.

## **BACKGROUND OF THE INVENTION**

Vibrating switches are widely used. In the prior art, mercury is used as a conductive media. Afterwards, rollers are used to replace mercury. Moreover, springs are used to replace rollers since the sensitivities of the springs are higher than those of rollers. There are two kinds of such structures. One has a metal housing and another has an isolating housing which is preferred than the metal housing since the insulating effect thereof.

The prior art vibrating switch has an isolating housing, a spring in the isolating housing, one end of the spring being a fixing end and another end thereof being a free end; a first conductive plate in the isolating housing and supporting the fixing end; a pin extended from the conductive plate and passing out of the isolating housing; a second conductive plate in the isolating housing and corresponding to the free end of the spring, another pin extending from the second conductive plate and passing out of the isolating housing; and a weight, like a small steel ball, attached to the free end of the spring.

The defects of aforementioned prior art are that the small steel ball can not be firmly secured to the free end of the spring. Thereby, in assembly, the steel ball is glued to the free end, but this is unbeneficial for electric conduction. Next, the free end of the spring is easily suspended downwards due to the weight of the small steel ball. Thereby, the spring is not horizontally arranged. Thereby, initially, the free end of the spring must be inclined, but this makes a difficult to workers.

## **SUMMARY OF THE INVENTION**

Accordingly, the primary object of the present invention is to provide a vibrating switch without any steel ball and being installed obliquely. Thereby, the installation of the vibrating switch is easy.

5 Another object of the present invention is to provide a vibrating switch which has a simple structure and occupies a smaller area.

A further object of the present invention is to provide a vibrating switch which can be assembled easily and economically.

To achieve above objects, the present invention provides a vibrating  
10 switch. The vibrating switch comprises an isolating housing, a spring on the isolating housing, one end of the spring being a free end and another end thereof being a fixing end, a conductive plate in the isolating housing having a gap to the free end; a metal support plate in the isolating housing and being at another side of the conductive plate for supporting the fixing  
15 end of the spring so that the spring is not supported in the lower end; and a first and a second pins extending out of the isolating housing; the first pin being connected to the conductive plate; and the second pin connected to the metal support plate or the fixing end of the spring. When the isolating housing vibrates, the free end of the spring will swing to contact the  
20 conductive plate so as to conduct current to the conductive plate.

The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing.

## **25 BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is an exploded perspective view of the vibrating switch in the first embodiment of the present invention.

Fig. 2 is an assembled perspective view of the vibrating switch illustrated in Fig. 1.

30 Fig. 3 is a cross section view about the vibrating switch of Fig. 1.

Fig. 4 is an assembled perspective view of the vibrating switch in the

second embodiment of the present invention.

Fig. 5 is a cross section view of the vibrating switch in Fig. 4.

## DETAILED DESCRIPTION OF THE INVENTION

5 In order that those skilled in the art can further understand the present invention, a description will be described in the following in details. However, these descriptions and the appended drawings are only used to cause those skilled in the art to understand the objects, features, and characteristics of the present invention, but not to be used to confine the  
10 scope and spirit of the present invention defined in the appended claims.

With reference to Fig. 1, the exploded perspective view of the present invention is illustrated. The vibrating switch 10 of the present invention includes an isolating housing 1, a spring 21 on the isolating housing 1, one end of the spring 21 being a free end 21 and another end thereof being a  
15 fixing end 22, a conductive plate 3 in the isolating housing 1 corresponding to the free end 21 of the spring 21 and having a gap to the free end 21; a metal support plate 4 in the isolating housing 1 and being at another side of the conductive plate 3 for supporting the fixing end 22 of the spring 21 so that the spring 21 is not supported in the lower end; and two pins 5; and 6;  
20 one pin 5 being connected to the conductive plate 3 and extending out of the isolating housing 1; and another pin 6 connected to the metal support plate 4 and extending out of the isolating housing 1. The pin 5 is integrally formed with the conductive plate 3 and the pin 6 is integrally formed with the metal support plate 4. The isolating housing 1 is formed with a casing  
25 1a and a bottom plate 1b. The pins 5, 6 are protruded out of notches of the casing 1a to be fixed to a circuit board (not shown). The assembled view of the present invention is illustrated in Fig. 2.

Referring to Fig. 2, the spring 21 is at a center position of the isolating housing 1. The free end 21 and fixing end 22 are at two ends and the  
30 springs are dense at the two ends. Thereby, the dense area at the free end 21 is longer than that of the fixing end 22. The fixing end 22 is welded to

the metal support plate 4. Thereby, the spring 21 is supported from an upper side thereof. The free end 21 is swingable by the weight itself. As the isolating housing 1 vibrates, the free end 21 will have a larger vibrating extent, as shown in Fig. 3. In vibration, as the free end 21 contacts the  
5 conductive plate 3, electric power is conducted therebetween.

Furthermore, to have more contact times between the free end 21 and the conductive plate 3, a protruding wedge 31 can be added to the conductive plate 3 for reducing the gap between the wedge 31 and the free end 21 so as to have a larger contact possibility.

10 With reference to Fig. 4, another embodiment of embodiment is illustrated. The difference of this embodiment from above mentioned embodiment is that a pin 23 extending from the fixing end 22 of the spring 2 and passing out of the isolating housing 1 for replacing the pin 6. The spring 2 has the same wire with the pin 23. The vibration of this  
15 embodiment is illustrated in Fig. 5.

The present invention is thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the present invention, and all such modifications as would be obvious to one skilled in the art are intended to  
20 be included within the scope of the following claims.